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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,130

Applicant(s)

FISCHIONE ET AL.

Examiner

Rodney G. McDonald

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,16-21,24-35,40-47,50-52,54-69,73-87,108-151 and 158-164 is/are pending in the application.
- 4a) Of the above claim(s) 152-157 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,16-21,24-35,40-47,50-52,54-69,73-87,108-129,131,138-141 and 152-164 is/are rejected.
- 7) ☒ Claim(s) 130,132-137 and 142-151 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 62 and 63 are withdrawn in view of the newly discovered reference(s) to Mahler (U.S. Pat. 4,595,483), Moslehi (U.S. Pat. 6,051,113), Siebert (U.S. Pat. 4,858,556). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 21, 24, 25, 158, 159, 160 are rejected under 35 U.S.C. 102(b) as being anticipated by Moslehi (U.S. Pat. 6,051,113).

Regarding claim 1, Moslehi teach an apparatus including a plasma generator for plasma cleaning the specimen. (Column 10 lines 27-28) The apparatus can include means for coating a specimen with conductive material. (Column 10 lines 25-27) The plasma cleaning and the coating of the specimen can be performed in a single process chamber under continuous vacuum conditions. (Fig. 2; Column 8 lines 53-54)

Regarding claim 6, Moslehi teach that the means for coating can be a magnetron sputtering device. (Column 10 lines 29-32)

Regarding claim 21, Moslehi teach utilizing a first vacuum pump for evacuating the chamber. (Column 8 lines 54-57)

Regarding claim 24, Moslehi teach utilizing an oil-free vacuum pump. (Column 8 lines 54-57)

Regarding claim 25, Moslehi teach utilizing a cryosorption vacuum pump.
(Column 8 lines 54-57)

Regarding claim 158, Moslehi teach a processing chamber including a sample stage being moveable to one or more positions in the processing chamber. Moslehi teach a position sensor for detecting a position of the specimen. The sample stage can be moved automatically to one or more processing positions remote from the first position in any of the three dimensions. (Fig. 2; Column 10 lines 25-28; Column 8 lines 53-54; Column 4 lines 17-44)

Regarding claim 159, the first position is measured relative to a second position along an axis. (Column 4 lines 17-44)

Regarding claim 160, the processing position can be one of coating or cleaning.
(Column 10 lines 25-28)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-5, 7, 32, 33, 34, 35, 45, 46, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (U.S. Pat. 6,051,113) in view of Siebert (U.S. Pat. 4,858,556).

Moslehi is discussed above and all is as applies above. (See Moslehi discussed above)

Regarding claim 45, Moslehi teach utilizing a first vacuum pump for evacuating the chamber. (Column 8 lines 54-57)

Regarding claim 46, Moslehi teach utilizing an oil-free vacuum pump. (Column 8 lines 54-57)

Regarding claim 47, Moslehi teach utilizing a cryosorption vacuum pump. (Column 8 lines 54-57)

The differences between Moslehi and the present claims is that the means for removing material is not discussed (Claims 2, 32), the means for removing being means for etching using an ion beam is not discussed (Claims 3, 33), the means for etching being an ion beam is not discussed (Claims 4, 34), the source of gas for the ion beam is not discussed (Claims 5, 35), directing an ion beam at a target for deposition is not discussed (Claim 7),

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Regarding claims 2, 32, Moslehi establish that another process energy source can be installed in the chamber. (Moslehi Column 10 lines 27-28) Siebert suggest incorporating a means for removing material from the specimen under vacuum conditions with other sources in the chamber. (Siebert Column 22 lines 8-22)

Regarding claims 3, 33, Siebert teach that the means for removing comprises means for etching using an ion beam. (Column 22 lines 19-22)

Regarding claims 4, 34, Siebert teach that the means for etching comprises an ion beam source for directing an ion beam at the specimen. (Column 22 lines 19-22)

Regarding claims 5, 35, a source of process gas is inherently positioned adjacent the ion source in order to produce the ion beam. (Column 22 lines 18-22)

Regarding claim 7, Siebert teach as the source an ion source for directing an ion beam at a target can be used. (Column 12 lines 64-68; Column 13 lines 1-3)

The motivation for utilizing the features of Siebert is that it allows for achieving process uniformity. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing the features of Siebert because it allows for achieving process uniformity.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (U.S. Pat. 6,051,113) in view of Ameen et al. (U.S. Pat. 6,143,128).

Moslehi is discussed above and all is as applies above. (See Moslehi discussed above)

The difference between Moslehi and the present claims is that the plasma generator is not discussed. (Claim 16)

Regarding claim 16, Ameen et al. teach that for cleaning a RF coil for a chamber can be utilized. (Column 9 lines 48-68; Column 10 lines 1-7)

The motivation for utilizing an RF coil for cleaning is that it allows for cleaning the substrate. (Column 9 lines 48-68; Column 10 lines 1-7)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing a plasma generator as taught by Ameen et al. because it allows for cleaning of the substrate.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Ameen et al. as applied to claim 16 above, and further in view of Chang et al. (U.S. Pat. 6,434,814).

The differences not yet discussed is the gases used for cleaning and multiple gas inlets and magnetron sputtering

Regarding claims 17, 18, 19, 20, Chang et al. teach that Ar and oxygen can be utilized for clean etching. Utilizing two gases would require two inlets for the gases. (Column 8 lines 57-65)

Chang et al. suggests magnetron coating for sputtering. (Column 6 lines 57-62)

The motivation for utilizing Ar and oxygen is that it allows for cleaning. (Column 8 lines 57-65)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized oxygen and argon as taught by Chang et al. because it allows cleaning of the substrate.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Mitro et al. (U.S. Pat. 5,922,179).

The differences not yet discussed are the rotating and tilting of the substrate (Claims 26 and 28) and the cooling of the substrate (Claim 27).

Regarding claim 26, Mitro et al. teach a specimen holder that rotates and rocks. (Column 4 lines 20-27)

Regarding claim 27, Mitro et al. teach a specimen holder that is cooled. (Column 3 lines 15-22)

The motivation for cooling, rotating and tilting the substrate is that it allows for uniform coating and etching of the film. (Column 4 lines 20-33)

Regarding claim 28, Moslehi suggest the stage being movable up and down along an axis. (See Moslehi Fig. 2)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have cooled, rotated and tilted the substrate holder as taught by Mitro et al. because it allows for uniform coating and etching of the film.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Siebert as applied to claims 1 and 2 above, and further in view of Mitro et al. (U.S. Pat. 5,922,179).

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The difference not yet discussed is the tilting and rotating of the specimen holder.
(Claim 29)

Regarding claim 29, Mitro et al. teach a specimen holder that rotates and rocks.
(Column 4 lines 20-27)

The motivation for rotating and tilting the substrate is that it allows for uniform coating and etching of the film. (Column 4 lines 20-33)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have rotated and tilted the substrate holder as taught by Mitro et al. because it allows for uniform coating and etching of the film.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Kobayashi et al. (U.S. Pat. 5,340,460).

Moslehi is discussed above and all as applies above. (See Moslehi discussed above)

The difference not yet discussed is the use of a cold trap.

Kobayshi et al. teach a cold trap in the chamber. (Column 4 lines 32-39; Fig. 3)

The motivation for providing a cold trap in the chamber is that it allows for capturing residual gases. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Nomura et al. by utilizing a cold trap as taught by Kobayashi et al. because it traps residual gases.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (U.S. Pat. 6,051,113) in view of Holland (U.S. Pat. 4,311,725).

Moslehi is discussed above and all is as applies above. (See Moslehi discussed above)

The difference not yet discussed is the crystal oscillator.

Holland teach a crystal oscillator for measuring the amount of total material deposited and ending deposition. (Column 8 lines 11-40)

The motivation for utilizing a crystal oscillator is that it allows for measuring the amount of film deposited. (Column 8 lines 11-40)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Nomura et al. by utilizing a crystal oscillator as taught by Holland because it allows for measuring the thickness.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Siebert as applied to claim 32 above, and further in view of Ameen et al. (U.S. Pat. 6,143,128).

The difference not yet discussed is that the plasma generator is not discussed. (Claim 16)

Regarding claim 40, Ameen et al. teach that for cleaning a RF coil for a chamber can be utilized. (Column 9 lines 48-68; Column 10 lines 1-7)

The motivation for utilizing an RF coil for cleaning is that it allows for cleaning the substrate. (Column 9 lines 48-68; Column 10 lines 1-7)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing a plasma generator as taught by Ameen et al. because it allows for cleaning of the substrate.

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Claims 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Siebert and further in view of Ameen et al. as applied to claims 32 and 40 above, and further in view of Chang et al. (U.S. Pat. 6,434,814).

The differences not yet discussed is the gases used for cleaning and multiple gas inlets and magnetron sputtering

Regarding claims 41, 42, 43, 44, Chang et al. teach that Ar and oxygen can be utilized for clean etching. Utilizing two gases would require two inlets for the gases. (Column 8 lines 57-65)

Chang et al. suggests magnetron coating for sputtering. (Column 6 lines 57-62)

The motivation for utilizing Ar and oxygen is that it allows for cleaning. (Column 8 lines 57-65)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized oxygen and argon as taught by Chang et al. because it allows cleaning of the substrate.

Claims 50-52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Siebert as applied to claim 32 above, and further in view of Mitro et al. (U.S. Pat. 5,922,179).

The differences not yet discussed are the rotating and tilting of the substrate (Claims 50 and 52) and the cooling of the substrate (Claim 51).

Regarding claim 50, Mitro et al. teach a specimen holder that rotates and rocks. (Column 4 lines 20-27)

Regarding claim 51, Mitro et al. teach a specimen holder that is cooled. (Column 3 lines 15-22)

The motivation for cooling, rotating and tilting the substrate is that it allows for uniform coating and etching of the film. (Column 4 lines 20-33)

Regarding claim 52, Moslehi suggest the stage being movable up and down along an axis. (See Moslehi Fig. 2)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have cooled, rotated and tilted the substrate holder as taught by Mitro et al. because it allows for uniform coating and etching of the film.

Claims 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Siebert as applied to claim 32 above, and further in view of Kobayashi et al. (U.S. Pat. 5,340,460).

Moslehi is discussed above and all as applies above. (See Moslehi discussed above)

The difference not yet discussed is the use of a cold trap.

Kobayshi et al. teach a cold trap in the chamber. (Column 4 lines 32-39; Fig. 3)

The motivation for providing a cold trap in the chamber is that it allows for capturing residual gases. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Nomura et al. by utilizing a cold trap as taught by Kobayashi et al. because it traps residual gases.

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Claims 55-64, 66, 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler (U.S. Pat. 4,595,483) in view of Moslehi (U.S. Pat. 6,051,113).

Regarding claim 55, Mahler teach an apparatus including means for coating a specimen with a material from a sputtering coating source and means for plasma etching the specimen. (Column 4 lines 1-10) The coating of the specimen and the plasma etching of the specimen occurs in a single vacuum chamber 4 evacuated by pump 29. (Column 4 lines 1-10; Column 5 lines 11-13)

Regarding claim 56, Mahler teach a vacuum pump 29 for evacuating the chamber. (Column 5 lines 11-13)

Regarding claim 58, the plasma etching is capacitive discharge plasma etching. (Column 2 lines 61-68; Column 3 lines 1-3)

Regarding claim 59, the substrate holder and the charging cover represent the first and second electrodes with the specimen in between. (Column 2 lines 61-68; Column 3 lines 1-3)

Regarding claim 60, the first and second electrodes are substantially planar and are parallel to one another. (Column 2 lines 61-68; Column 3 lines 1-3)

Regarding claim 61, a specimen stage 26 for holding the substrate and being part of the first electrode is present. (Column 4 lines 53-56)

Regarding claim 63, the second electrode cover can move the in a direction perpendicular by a lift device. (Column 4 lines 7-10)

Regarding claim 64, teach utilizing an alternating voltage source for generating the plasma. (Column 2 lines 63)

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The differences between Mahler and the present claims is that the deposition of conductive material is not discussed (Claim 55), the oil free vacuum pump is not discussed (Claim 57), the specimen stage being moveable in a direction substantially perpendicular to the planar surface of the first electrode is not discussed (Claim 62), the means for coating utilizing a magnetron sputtering device is not discussed (Claim 66) and plasma cleaning the specimen is not discussed (Claim 76).

Regarding claim 55, Moslehi teach depositing conductive material. (Column 12 lines 15-17)

Regarding claim 57, Moslehi teach utilizing an oil free vacuum pump such as cryo pump. (Column 8 lines 54-57)

Regarding claim 62, Moslehi teach moving the specimen stage up and down. (See Fig. 2)

Regarding claim 66, Moslehi teach utilizing a magnetron sputtering device. (Column 10 lines 28-32)

Regarding claims 76, Moslehi teach plasma cleaning the specimen. (Column 10 lines 27-28)

The motivation for utilizing the features of Moslehi is that it allows for producing substrate at high throughput. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Mahler by utilizing the features of Moslehi because it allows for producing substrate at high throughput.

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Claims 65, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi as applied to claim 55 above, and further in view of Ameen et al. (U.S. Pat. 6,143,128).

The difference not yet discussed is the use of an inductively coupled plasma (claims 65, 77, 83).

Regarding claims 65, 77, Ameen et al. teach that for cleaning a RF coil for a chamber can be utilized. (Column 9 lines 48-68; Column 10 lines 1-7)

The motivation for utilizing an RF coil for cleaning is that it allows for cleaning the substrate. (Column 9 lines 48-68; Column 10 lines 1-7)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing a plasma generator as taught by Ameen et al. because it allows for cleaning of the substrate.

Claims 78-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi and further in view of Ameen et al. as applied to claims 55, 76, 77 above, and further in view of Chang et al. (U.S. Pat. 6,434,814).

The differences not yet discussed is the gases used for cleaning and multiple gas inlets and magnetron sputtering

Regarding claims 78, 79, 80, 81, Chang et al. teach that Ar and oxygen can be utilized for clean etching. Utilizing two gases would require two inlets for the gases. (Column 8 lines 57-65)

Chang et al. suggests magnetron coating for sputtering. (Column 6 lines 57-62)

The motivation for utilizing Ar and oxygen is that it allows for cleaning. (Column 8 lines 57-65)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized oxygen and argon as taught by Chang et al. because it allows cleaning of the substrate.

Claims 67, 68, 69, 73, 74, 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi as applied to claim 55 above, and further in view of Siebert (U.S. Pat. 4,858,556).

Regarding claim 82, Moslehi teach plasma cleaning the specimen. (Column 10 lines 27-28)

The differences not yet discussed is ion beam sputtering (Claim 67), a means for ion etching under continuous vacuum conditions (Claim 68), the ion source for ion beam etching (Claim 69), selectively directing the ion beam at the specimen (Claim 73) and a specimen stage for moving the specimen inside and outside of the path of the ion beam (Claim 74).

Regarding claim 67, Siebert suggest ion beam sputtering. (Column 22 lines 9-22)

Regarding claim 68, Siebert suggest ion etching under continuous vacuum conditions. (Column 22 lines 9-22)

Regarding claim 69, Siebert teach an ion beam for etching. (Column 22 lines 9-22)

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Regarding claim 73, Siebert teach utilizing a shutter to selectively expose the specimen to ion beam etching. (Column 11 lines 31-43)

Regarding claim 74, Siebert teach a specimen stage for moving the specimen inside and outside of the ion beam. (Column 10 lines 56-60)

The motivation for utilizing the feature of Siebert is that it allows for depositing uniform films. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Siebert because it allows for depositing uniform films.

Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi and further in view of Siebert as applied to claims 55, 68, 82 above, and further in view of Ameen et al. (U.S. Pat. 6,143,128).

The difference not yet discussed is the use of an inductively coupled plasma (claims 65, 77, 83).

Regarding claims 65, 77, Ameen et al. teach that for cleaning a RF coil for a chamber can be utilized. (Column 9 lines 48-68; Column 10 lines 1-7)

The motivation for utilizing an RF coil for cleaning is that it allows for cleaning the substrate. (Column 9 lines 48-68; Column 10 lines 1-7)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing a plasma generator as taught by Ameen et al. because it allows for cleaning of the substrate.

Claims 84-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi and further in view of Siebert and further in view of Ameen et al. as applied to claims 55, 68, 82, 83 above, and further in view of Chang et al. (U.S. Pat. 6,434,814).

The differences not yet discussed is the gases used for cleaning and multiple gas inlets and magnetron sputtering

Regarding claims 84-87, Chang et al. teach that Ar and oxygen can be utilized for clean etching. Utilizing two gases would require two inlets for the gases. (Column 8 lines 57-65)

Chang et al. suggests magnetron coating for sputtering. (Column 6 lines 57-62)

The motivation for utilizing Ar and oxygen is that it allows for cleaning. (Column 8 lines 57-65)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized oxygen and argon as taught by Chang et al. because it allows cleaning of the substrate.

Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Moslehi and further in view of Siebert as applied to claims 55, 67, 73, 74 above, and further in view of Mitro et al. (U.S. Pat. 5,922,179).

The differences not yet discussed are the rotating and tilting of the substrate (Claim 75).

Regarding claim 75, Mitro et al. teach a specimen holder that rotates and rocks. (Column 4 lines 20-27)

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The motivation for rotating and tilting the substrate is that it allows for uniform coating and etching of the film. (Column 4 lines 20-33)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have rotated and tilted the substrate holder as taught by Mitro et al. because it allows for uniform coating and etching of the film.

Claims 108, 109, 116, 117, 119, 121, 122, 123, 124, 129, 131, 138, 139, 140 and 141 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler (U.S. Pat. 4,595,483) in view of Siebert (U.S. Pat. 4,858,556) and Moslehi (U.S. Pat. 6,051,113).

Mahler is discussed above and teach a vacuum chamber, a plasma etching device and means for coating the specimen. The plasma etching and the coating can be carried out in a single chamber under vacuum conditions. Mahler suggest plasma etching utilizing capacitive discharge. Mahler teach utilizing a sample stage being at least part of a second electrode. Mahler teach a gap formed between two electrodes and alternating voltage to produce the plasma etching. Mahler teach that the user can set the parameters. Mahler teach a sample stage for holding the specimen. Mahler teach moving the sample stage to different process stations. (See Mahler discussed above)

The differences between Mahler and the present claims is the use of an ion source for etching is not discussed (claim 108), the sputtering of conductive material is not discussed (Claim 108), a plasma generator for plasma cleaning is not discussed (Claim 109), an oil-free vacuum pump is not discussed (Claim 116), the type of oil free pump is not discussed (Claim 117), the ion beam sputtering of a target is not discussed

(claim 129), ion beam a plurality of target is not discussed (claim 131), automatic control is not discussed (Claim 140, 141).

Regarding claim 108, Siebert discussed above teach an ion beam etching source for use in a vacuum chamber along with other sources. (See Siebert discussed above)

Regarding claim 119, Siebert discussed above teach ion beam etching. (See Siebert discussed above)

Regarding claim 129, Siebert discussed above teach ion beam sputtering of a target. (See Siebert discussed above)

Regarding claim 131, Siebert discussed above teach ion beam sputtering multiple targets. (See Siebert discussed above)

Regarding claims 140, 141, Siebert discussed above teach automatic control. (See Figures 13-19)

The motivation for utilizing the features of Siebert is that it allows for depositing uniform films. (See Siebert discussed above)

Regarding claim 108, Moslehi discussed above utilizes a conductive material for depositing on a specimen along with other sources. (See Moslehi discussed above)

Regarding claim 109, Moslehi discussed above teach a plasma generator for plasma cleaning a specimen. (See Moslehi discussed above)

Regarding claim 116, Moslehi discussed above teach a oil free vacuum pump. (See Moslehi discussed above)

Regarding claim 117, Moslehi discussed above teach a cryo pump. (See Moslehi discussed above)

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The motivation for utilizing the features of Moslehi is that it allows for increasing throughput. (See Moslehi discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified Mahler by utilizing the features of Siebert and Moslehi because it allows for depositing a uniform film and increasing throughput.

Claims 110 and 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Siebert and Moslehi as applied to claims 108 and 109 above, and further in view of Ameen et al. (U.S. Pat. 6,143,128).

The difference not yet discussed is the structure of the plasma generator (Claims 110, 111)

Regarding claim 110, Ameen et al. discussed above teach the structure of the plasma generator. (See Ameen et al. discussed above)

The motivation utilizing the features of Ameen et al. because it allows for cleaning the substrate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ameen et al. because it allows for cleaning the substrate.

Claims 112-115, 120, 125, 126, 127, 128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Siebert and Moslehi and further in view of Ameen et al. as applied to claims 108, 109, 110, 111, 121, 122, 123 above, and further in view of Chang et al. (U.S. Pat. 6,434,814).

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The differences not yet discussed are the process gas including oxygen (claim 112), the process gas including argon (claim 113), the process gas mixture (Claim 114), the process gas utilizing a non-reactive gas (Claim 115), the reactive gas (Claim 120), the two gas inlets (claims 125, 127), the process gas being oxygen (Claims 126, 128),

Regarding claims 112-115, 120, 125, 126, 127, 128, Chang et al. discussed above teach the required gas mixture, the two inlets and oxygen. (See Chang et al. discussed above)

The motivation for utilizing the features of Chang et al. is that it allows for cleaning. (See Chang et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Chang et al. because it allows for cleaning.

Claim 118 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahler in view of Siebert and Moslehi as applied to claim 108 above, and further in view of Nomura et al. (U.S. Pat. 6,641,703).

The difference not yet discussed is the use of a load lock. (Claim 118)

Regarding claim 118, Nomura et al. teach the load/unload chamber. (Column 6 lines 22-25)

The motivation for utilizing load lock chamber is for loading of the substrate. (Column 6 lines 22-25)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilizing a load lock as taught by Nomura et al. because it allows for loading the substrate.

Claims 161, 162, 163, 164 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (U.S. Pat. 6,051,113) in view of Baldwin et al. (U.S. Pat. 6,419,802).

Regarding claim 161, Moslehi teach a processing chamber including a sample stage being moveable to one or more positions in the processing chamber. Moslehi teach a position sensor for detecting a position of the specimen. The sample stage can be moved automatically to one or more processing positions remote from the first position in any of the three dimensions. (Fig. 2; Column 10 lines 25-28; Column 8 lines 53-54; Column 4 lines 17-44)

Regarding claim 162, the first position is measured relative to a second position along an axis. (Column 4 lines 17-44)

Regarding claim 163, the processing position can be one of coating or cleaning. (Column 10 lines 25-28)

The differences between Moslehi and the present claims is that the use of a beam such as a laser is not discussed (claims 161, 164)

Regarding claim 164, Baldwin et al. teach utilizing a beam (i.e. laser) for sensing the position of the substrate. (Column 4 lines 17-44)

The motivation for utilizing a sensor is that it determines the position of the substrate. (Column 4 lines 17-44)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Moslehi by utilizing a position sensor and laser as taught by Baldwin et al. because it allows for determining the position of the substrate.

Allowable Subject Matter

Claims 130, 132-137, 142-151 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed June 26, 2006 have been fully considered but they are not persuasive.

In response to the argument that the prior art does not teach utilizing a single process chamber, to perform the processes, it is argued that Moslehi teach utilizing a single processing chamber to perform at least depositing and cleaning in the chamber. (See Moslehi discussed above)

In response to the argument that Moslehi does not teach locating the substrate outside of the XY plane of the turntable, it is argued that Moslehi teach in Fig. 2 an up and down actuator for moving the holder out of the XY plane. (See Moslehi discussed above; Moslehi Fig. 2)

This action will be made NON-Final based on the new rejections.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
September 15, 2006